Abstract

A system and method of developing better-designed medical devices, particularly

5 cardiovascular stents and endovascular grafts. The system comprises a geometry generator, a

mesh generator, a stress/strain/deformation analyzer, and a visualization tool. In one

embodiment, the geometry generator receives three-dimensional volumetric data of an

anatomical feature and generates a geometric model. The mesh generator then receives such

geometric model of an anatomical feature or an in vitro model and a geometric model of a

10 candidate medical device. In another embodiment, the mesh generator only receives a geometric

model of the candidate medical device. Using the geometric model(s) received, the mesh

generator creates or generates a mesh or a finite element model. The stress/strain/deformation

analyzer then receives the mesh, and the material models and loads of that mesh. Using analysis,

preferably non-linear analysis, the stress/strain/deformation analyzer determines the predicted

15 stresses, strains, and deformations on the candidate medical device. Such stresses, strains, and

deformations may optionally be simulated visually using a visualization tool.

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